APPENDIX E

I-PLAN

for

WATERSHEDS

WATERSHEDS IMPLEMENTATION PLAN

1. EXECUTIVE SUMMARY

The Idaho Department of Water Resources (IDWR), the Natural Resource Conservation Service (NRCS), the Bureau of Land Management (BLM), and the Forest Service (USFS), in cooperation with various state and local agencies, are in the process of updating 5th- and 6th-field subwatershed boundaries for the State of Idaho. The purpose of this project is to replace existing data, originally compiled at 1:100,000, with 1:24,000 data using the *Federal Standards for Delineation of Hydrologic Unit Boundaries*, http://www.ftw.nrcs.usda.gov/huc_data.html (Attachment A), latest version dated March 1, 2002.

In order to create watershed delineations, existing lines are gathered from various sources and are compiled for each hydrologic unit. Watershed Stewards, usually a local land manager, will take the lead in providing initial delineations for each hydrologic unit. These stewards examine existing lines and draft new lines, where necessary, for review by the watershed technical working group (WTWG). The watershed TWG convenes to look at the draft lines on a hydrologic unit-by-hydrologic unit basis. The purpose of these meetings is to review the draft lines for compliance with national standards and to reach an agreement on placement of lines with all interested parties. Local hydrologists, government, and private individuals with local interest and knowledge are invited to participate in these delineation meetings. Information from neighboring states and existing watershed lines will also be incorporated to insure boundary consistency.

After the draft delineation process is complete, each subwatershed boundary is revised to follow contour lines consistent with 1:24,000 scale data. Statewide 1:24,000 Digital Raster Graphs (DRG) and hydrography data will be used, along with National Elevation Data (NED) Shaded Relief and aerial photos to determine boundary lines. Polygon attributes will also be updated pursuant to these new federal standards.

When the entire state is complete, the watershed coverage will be available for a final draft review. Revisions will be made, and the final product will be sent to the national watershed coordinator, **Kenny Legleiter, NRCS,** for review and certification. Final certified data will be incorporated into the National Watershed Boundary Dataset, available in both coverage and shapefile formats, for use with ArcInfo and ArcView software.

Information about the watershed delineation process in Idaho, including meeting minutes, status maps, Steward information, and links to federal standards may be viewed at www.idwr.state.id.us/watersheds. Preliminary line work, including watersheds from

neighboring states, may be viewed on a map-enabled watershed server at maps.idwr.state.id.us/watersheds.

2. DESCRIPTION

2.1 Theme Description

The Idaho Department of Water Resources (IDWR), the Natural Resource Conservation Service (NRCS), the Bureau of Land Management (BLM) and the Forest Service (USFS), in cooperation with various state and local agencies, are in the process of updating watershed (5th field or 10-digit) and subwatershed (6th field or 12-digit) boundaries for the State of Idaho.

The purpose of this project is to replace existing data, originally compiled at 1:100,000, with 1:24,000 data using the *Federal Standards for Delineation of Hydrologic Unit Boundaries* http://www.ftw.nrcs.usda.gov/huc_data.html (Attachment A), latest version dated March 1,2002. By using these standards, and coordinating with local hydrologists, land managers, neighboring states, and interested parties, we will strive to obtain a hydrologically correct, seamless, and consistent national Geographic Information System (GIS) database. The watershed level size is primarily 40,000 to 250,000 acres and subwatershed level size is typically 10,000 to 40,000 acres.

History

During the 1970s the US Geological Survey (USGS) developed a hierarchical hydrologic unit code (HUC) for the United States. This system divides the country into 21 Regions, 222 Subregions, 352 Accounting Units, and 2,149 Cataloging Units based on surface hydrologic features. The smallest USGS Cataloging Unit (8-digit hydrologic unit) is approximately 448,000 acres. During the late 1970s the NRCS, formerly the Soil Conservation Service, initiated a national program to further subdivide hydrologic units into smaller watersheds for water resources planning. A 3-digit extension was added to the 8-digit number. By the early 1980s, this 11-digit watershed mapping was completed for most of the U.S. During the 1980s several NRCS state offices started mapping watersheds into subwatersheds by adding 2 or 3-digits to the 11-digit hydrologic unit. By the late 1980s and early 1990s, the advent of GIS made the mapping of digital watershed boundaries feasible and the NRCS decided to delineate and map the entire U.S. to the 11 and 14-digit level by GIS incorporating DEMs, DRGs, and a variety of geospatial data and techniques.

There was a recognized need for standardized boundaries, but there was no consistent accepted national standard for watershed delineation. In the early 1990s, the state of Idaho was working with state and federal agencies to delineate a watershed layer based on the 1:100,000 scale hydrography for the entire state. These watershed boundaries were delineated using a set of standards agreed on by a watershed working group, a group that consisted of both federal and state agencies, as well as representatives from the private sector. Although these watershed boundaries are hydrologically based, they differ from the new standards in size, name, and numbering convention.

In 1992, the NRCS produced a national standard (NI-170-304-superseded by National Interagency Guidelines) that established procedures and specifications for delineating and mapping watershed and subwatershed boundaries. These guidelines were written to help delineators produce accurate and consistent boundaries nationwide. They also specified standards for a digital database that would be usable with other natural resource digital data layers in a GIS environment. This document was updated in 1995 and is available as NI 170-304 along with a summary of updates made since June 1995. An effort to delineate and digitize the hydrologic units has been coordinated by NRCS and other federal, state, and local agencies with cooperation from other interested parties. The National Cartography and Geospatial Center (NCGC) within the NRCS is providing coordination, verification, and certification of state datasets, as well as integrating each state's watersheds into one national dataset. An estimated 22,000 watersheds and 160,000 subwatersheds will be mapped to the 5th and 6th levels nationally. The GIS layers will be available on the Internet to everyone, including federal, state, local government agencies, researchers, private companies, utilities, environmental groups, and concerned citizens. The database will assist in planning and describing water use and related land use activities.

The Subcommittee on Spatial Water Data Federal Geographic Data Committee (FGDC) worked to establish a federal interagency standard describing the mapping and delineation process suitable for all agencies. In cooperation with the FGDC and the Advisory Committee on Water Information (ACWI), a new interagency guideline has been written. During December 2000, this document was presented to the FGDC for its review. **This document has superseded NI 170-304 as the official standard for delineation of 5th- and 6th-level hydrologic units.**

Current Work

Each boundary will be reviewed and revised to follow contour lines consistent with 1:24,000 scale data. Statewide 1:24,000 DRG and hydrography data will be used, along with NED Shaded Relief and aerial photos to determine boundary lines. Polygon attributes will also be updated pursuant to USGS standards.

Each hydrologic unit has a data Steward that is usually a representative of the agency with primary land management responsibility. The Steward usually provides the initial delineation based on existing line work. They also represent other land management groups and individuals interested in the hydrologic unit. With this information, the Steward produces a set of draft lines that are presented to the technical working group. After the draft delineation process is complete, government and private individuals with local interest and knowledge will be invited to participate in a coordination workshop for each hydrologic unit. Information from neighboring states will also be incorporated to insure boundary consistency. All interested parties are invited to attend. The lines are reviewed for compliance with national standards. Any disagreements over the line placement are resolved and then the hydrologic unit is considered "draft approved."

After the draft delineation process is complete each boundary within the hydrologic unit is revised to follow contour lines consistent with 1:24,000 scale data. DRG and hydrography data

will be used, along with NED shaded relief and aerial photos, to determine boundary lines. Polygon attributes will also be updated pursuant to these new federal standards.

Information about the watershed delineation process in Idaho, including meeting minutes, status maps, steward information, and links to federal standards, may be viewed at www.idwr.state.id.us/watersheds. Preliminary line work, including watersheds from neighboring states may be viewed on a map-enabled watershed server at maps.idwr.state.id.us/watersheds.

2.2 Vision Statement

The goal is to achieve a common, seamless, statewide watershed layer that can be used for exchange and reporting of data between agencies. By involving local knowledge and using national standards, we will provide a layer that will be hydrologically correct and useful.

2.3 Interdependencies

Watersheds are dependent on elevation and hydrography, and each subsequent subwatershed delineation needs to nest inside the parent watershed. The hydrologic unit boundaries are coincident with USGS cataloging unit boundaries, sometimes called "fourth-field watersheds," "HUCs," or "sub-basins."

Many administrative boundaries are coincident with watershed boundaries. For instance, IDWR Administrative Basin boundaries often follow ridgelines. The BLM and the Idaho Department of Fish and Game also use basin boundaries. A consistent set of line work will better enable agencies to share data that relate to common boundaries.

3. BENEFITS AND RISKS

3.1 Benefits and Driving Issues

The benefits of watershed delineation are a constant, seamless dataset. The data can be used for analysis, reporting and data exchange on a hydrologic unit, region, or statewide basis. Watersheds are used by hydrologists for water quality studies and water quantity estimations. Planners and biologists use watersheds and subwatersheds for basin studies and habitat analysis.

3.2 Risk Analysis

Statewide analysis relies upon a complete, consistent dataset. Not involving local knowledge and soliciting input from all interested parties may lead to incorrect delineations. If this dataset is not completed, there will be multiple watershed layers. Different datasets from numerous agencies will lead to difficult exchange and use of data.

4. INVENTORY

4.1 Stakeholders

The creation of new watershed and subwatershed delineations is a collaborative effort between numerous agencies and individuals from both private and public sectors. The following is a list of stakeholders who have either contributed data or provided input regarding watershed delineation, but may not include all who have either contributed in the past or will contribute in the future:

> Natural Resource Conservation Service, Idaho Department of Water Resources, Bureau of Land Management, Forest Service, USGS, Bureau of Reclamation, Idaho Department of Fish and Game, Idaho Department of Lands, Regional Ecosystem Office (REO), Montana Natural Resource Information System, State of Oregon Water Resources Division, Bennett Lumber Company, Bureau of Indian Affairs, Boise Cascade Corporation, Ch2M Hill, Coeur d'Alene Tribe, Duck Valley Tribe, Environmental Protection Agency, GeoMar Consulting LTD (Y2Y Conservation), INEEL, Kalispel Tribe, Kootenai Tribe, NRIS Water, WO-EMC, Potlatch Corporation, Rocky Mountain Research Station, State of Utah, State of Nevada, State of Montana, State of Wyoming, State of Oregon, State of Washington, Environmental Protection Agency, University of Idaho, Boise State University, State of Idaho-Access Idaho

4.2 Data Sources

The Stewards have submitted watershed data in various formats, projections, and stages of completion. The Stewards for Idaho include BLM, Boise National Forest, Caribou National Forest, Clearwater National Forest, Idaho Department of Water Resources, Natural Resource Conservation Service, Kootenai National Forest, Nez Perce National Forest, Panhandle National Forest, Payette National Forest, Salmon-Challis National Forest, Sawtooth National Forest, Targhee National Forest, Umatilla National Forest, Wallowa-Whitman National Forest. Additional delineations are submitted to the Stewards by other agencies and incorporated into the dataset maintained by the Stewards. Data is distributed by each Steward until the review process has been completed by the technical working group. The Idaho Department of Water Resources then maintains the data in a draft master watershed coverage.

4.3 Current Status

The Steward creates watershed data in Idaho with the assistance of any interested entity, public or private. The Steward maintains data until the technical working group has initiated the review process. After a set of draft lines has been agreed upon, the data is incorporated into the draft master watershed coverage maintained by the IDWR. As of March, 2003, draft concept lines were approved by the WTWG for 17 hydrologic units, or 20 percent. Each hydrologic unit is in some stage of final completion, which includes aligning line work to ridgelines and populating attributes pursuant to the standards.

4.4 Business Needs

The watershed hydrologic unit dataset is closely tied to the national hydrologic dataset in a framework that will be an invaluable tool for the assessment of water quality and consumptive

issues from a local to national level. This dataset will support modeling and management of natural resources for all sectors of government, organizations, and private individuals.

4.5 Challenges

Timelines are a major challenge when coordinating with other states. Wyoming completed and submitted watersheds for certification a year ago. Nevada is just beginning to delineate concept lines. Other hurdles include making sure that all interested parties are included. We have also had technological challenges such as difficulties with NetMeeting. Budget restrictions for various agencies make funding difficult and impacts watershed-dedicated personnel resources. Training poses another problem. Organizations require knowledgeable personnel, data, and equipment to complete the task. Data tied to older watersheds needs to be incorporated into the new draft watershed layer and documented. Each member of the WTWG has other duties. The federal standards are in draft form, and no date has been set for the final product. Although final standards are not anticipated to significantly change the existing draft standards, some adjustments may have to be made to the final watershed layer.

5. STANDARDS

Standards are based on the federal draft standard – *Federal Standards for Delineation of Hydrologic Unit Boundaries, March 2001 – March 2002,* http://www.ftw.nrcs.usda.gov/huc_data.html.

6. IMPLEMENTATION STRATEGY

6.1 Implementation Approach

Implementation varies for each watershed. The length of the process and individuals involved is unique for each hydrologic unit. Each hydrologic unit has a Steward as well as a group of land managers, state representatives, and individuals with an interest in the watershed. All of the groups are invited to participate in the process. The watersheds are published on an Internet map site allowing people to view the delineations and provide comments to the WTWG. When Idaho is complete, IDWR will send the integrated dataset to Kenny Legleitner for certification and inclusion into the national dataset.

6.2 Implementation Team

The implementation team consists of a Steward who is responsible for delineation on a specific watershed. The Steward develops concept lines with the help of any interested parties with local knowledge of the area. When this process is complete, the Steward presents the concept lines to the WTWG during a review meeting. Interested parties are again invited to participate in the review meetings to provide input. Additional changes or updates may be identified, and several review meetings may be necessary before a hydrologic unit is considered "draft approved." Additional work may continue on the hydrologic unit, including adjusting line work to follow ridgelines consistent with 1:24,000 scale accuracy standards and populating attribute fields. When a hydrologic unit is considered draft approved by all interested parties, it will be

incorporated into the master draft watershed coverage maintained by IDWR and posted on an Internet map server, providing an additional comment period. After all hydrologic units have gone through the process outlined above and have been incorporated into the master draft watershed coverage, a final review period will take place. The entire statewide coverage will then be sent NCGC for verification. Verification of watersheds is a phased process. Phase I is a provisional verification by NCGC and an interagency review team. If the dataset meets the FGDC Proposal, Version 1.0 HU guidelines, NCGC will send a letter to the originating office stating that the data meets the national guidelines. If the data fails to meet the guidelines, the letter will state the problems with the dataset. The second phase is a national verification completed by the member agencies of the FGDC Subcommittee on Spatial Water Data. The data must meet all the criteria as stated in the final approved FGDC *Federal Standards for Delineation of Hydrologic Unit Boundaries*. The Chairman of the Subcommittee on Spatial Water Data will send a letter to the state indicating the dataset is approved.

6.3 Data Development

Watershed data will include a nesting hierarchy of watershed and subwatershed polygon (polygon.pat) data, attribute (label.pat) data, and line (line.aat) data outlined in the *Federal Standards for Delineation of Hydrologic Data* manual, dated March 1, 2002. First priority will be given to the numbering, naming and acreage values of watersheds and subwatersheds. These will include the following attributes:

Huc_8 – 4th-level hydrologic unit number
Huc_10 – 5th-level number identifying the watershed
Huc_12 – 6th-level number identifying the subwatershed
Acres – number of acres for the subwatershed polygon
Hu_10_name – Name of the watershed
Hu_12_name – Name of the subwatershed

Additional attributes, such as watershed type and states, etc., will be populated as the dataset progresses. This work is usually done by the Steward but may be distributed to other agencies for completion at the Steward's discretion.

6.4 Data Maintenance

Data will be maintained by IDWR and within the National dataset. IDWR will coordinate changes or updates to the watershed layer through the WTWG and then send those changes to the federal agency responsible for maintaining the national dataset. Data will be maintained in coverage format, with polygon and line attributes outlined in the *Federal Standards for Delineation of Hydrologic Data.* Data will be maintained by IDWR and will use the REGION data model for watershed, subwatershed, and hydrologic units after Idaho has been completed.

6.5 Data Distribution

Data will be available through IDWR, INSIDE Idaho, and the national watershed coordinator. The data will be available for distribution via a website, and the data will be updated as updates become available.

6.6 Implementation Schedule

The WTWG usually meets once a month in an all-day session. Three to six hydrologic units are reviewed with local interested people. Many hydrologic units require more than one meeting with the WTWG to produce a set of mutually agreed upon concept lines. The estimated completion date for producing concept lines is December 2004. The date for completion of lines at a 1:24,000 scale depends on funding within various agencies and cannot be estimated at this time.

6.7 Cost Estimates

The cost varies for each hydrologic unit. Contract estimates have ranged from $500 to $800 per hydrologic unit. No money is available at this time for delineation efforts. Current work is being done within various agencies by existing staff.

7. RECOMMENDATIONS

7.1 Recommendations for Institutional and Financial Initiatives

None

7.2 Recommendations for Data Stewardship

Stewards are based on the land managers or interested parties in the basin. Integrators are IDWR on state basis and NRCS on the national level.

7.3 Recommendations for Legislative Initiatives

None

7.4 Recommendations for Policy, Rule and Procedural Changes

None

7.5 Recommendations for Data Standards

Standards are based on the federal draft standards – *Federal Standards for Delineation of Hydrologic Unit Boundaries March 2001 – March 2002,* http://www.ftw.nrcs.usda.gov/huc_data.html (Attachment A).

8. PLAN UPDATE CYCLE

This plan should be reviewed once a year. Updates may occur more frequently if changes occur to standards, funding opportunities, or stewardship roles.